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Proceedings of the Maritime Provinces Regional Advisory Process on Stock Assessment of Areas 1, 3, 4, 5, and 6 Scallop Stocks

12-13 December 2006

Future Inns Dartmouth
Dartmouth, Nova Scotia

Ross Claytor
Meeting Chair

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November 2007

Compte rendu des réunions du Processus consultatif régional des Maritimes sur l'évaluation des stocks de pétoncle des zones 1, 3, 4, 5 et 6

Les 12 et 13 décembre 2006

Future Inns Dartmouth
Dartmouth (Nouvelle-Écosse)

Ross Claytor
Président de réunion

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novembre 2007

Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings include research recommendations, uncertainties, and the rationale for decisions made by the meeting. Proceedings also document when data, analyses, or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

Avant-propos

Le présent compte rendu a pour but de documenter les principales activités et discussions qui ont eu lieu au cours de la réunion. Il contient des recommandations sur les recherches à effectuer, traite des incertitudes et expose les motifs ayant mené à la prise de décisions pendant la réunion. En outre, il fait état de données, d'analyses ou d'interprétations passées en revue et rejetées pour des raisons scientifiques, en donnant la raison du rejet. Bien que les interprétations et les opinions contenus dans le présent rapport puissent être inexacts ou propres à induire en erreur, ils sont quand même reproduits aussi fidèlement que possible afin de refléter les échanges tenus au cours de la réunion. Ainsi, aucune partie de ce rapport ne doit être considéré en tant que reflet des conclusions de la réunion, à moins d'indication précise en ce sens. De plus, un examen ultérieur de la question pourrait entraîner des changements aux conclusions, notamment si l'information supplémentaire pertinente, non disponible au moment de la réunion, est fournie par la suite. Finalement, dans les rares cas où des opinions divergentes sont exprimées officiellement, celles-ci sont également consignées dans les annexes du compte rendu.

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SUMMARY

These proceedings record discussions and recommendations that were held during the Regional Advisory Process (RAP) meetings for the Bay of Fundy scallop stocks on 12-13 December 2006. The purpose was to review the preliminary advice provided for the Full Bay fleet for the 2006/2007 fishery and to provide preliminary advice for the 2007/2008 fishery. Documentation from the meeting will include these proceedings, research documents, and a Science Advisory Report (SAR).

SOMMAIRE

Le présent compte rendu fait état des discussions et des recommandations auxquelles ont donné lieu les réunions sur les stocks de pétoncle de la baie de Fundy tenues dans le cadre du Processus consultatif régional (PCR) les 12 et 13 décembre 2006. Ces réunions avaient pour but d'examiner l'avis préliminaire visant la flottille de la totalité de la baie pour la saison de pêche 2006-2007 et de formuler un avis préliminaire pour la saison de pêche 2007-2008. Elles ont abouti à la publication du présent compte rendu et d'un Avis scientifique (AS).

INTRODUCTION

The Chair, Ross Claytor of Department of Fisheries and Oceans (DFO), opened the meeting for the Scallop Production Areas (SPAs) 1, 3, 4, 5, and 6 scallop stocks. The remit was identified as:

Area 1 Scallop:

- Assess the status of Area 1 scallop. The assessment should include:
  - An analysis of available commercial and survey information since 1981.
  - Application of the assessment model used in CSAS research document 2003/010.
- Application of the assessment model used in CSAS research document 2003/010 for the 8–16 mile Digby area for Full Bay fleet.
- Review the preliminary advice provided for the Full Bay fleet for the 2006/2007 fishery and provide preliminary advice for the 2007/2008 fishery.
- Provide updated advice for the 2007 fishery.
- Produce a section of the inshore scallop Science Advisory Report (SAR) documenting the results of the assessment.

Area 3 Scallop:

- Assess the status of Area 3 scallop. The assessment should include:
  - An analysis of available commercial and survey information.
- Provide advice for the 2007 fishery.
- Produce a section of the inshore scallop Science Advisory Report documenting the results of this assessment.

Area 4 Scallop:

- Assess the status of Area 4 scallop. The assessment should include:
  - An analysis of available commercial and survey information.
  - Application of the assessment model used in CSAS research document 2003/010.
- Review advice provided for the 2006/2007 fishery and provide preliminary advice for the 2007/2008 fishery.
- Produce a section of the inshore scallop Science Advisory Report documenting the results of the assessment.

Area 5 Scallop:

- Assess the status of Area 5 scallop. The assessment should include:
  - An analysis of available commercial and survey information.
- Provide advice for the 2007 fishery.
- Produce a section of the inshore scallop Science Advisory Report documenting the results of this assessment.

Area 6 Scallop:

- Assess the status of Area 6 scallop. The assessment should include:
  - An analysis of available commercial and survey information since 1997.
- Provide advice for the 2007 fishery.

- Produce a section of the inshore scallop Science Advisory Report documenting the results of this assessment.

For all areas, estimate bycatch of non-scallop species in the fishery for as many years as possible.

External reviewers, John Tremblay and Robert Mohn, provided initial comment on the working paper and presentation, and the Chair opened the meeting to the floor for additional comment. Comments were received by section of the working paper.

Upon the completion of the review of the working paper, the Science Advisory Report was reviewed.

SUMMARY OF CONCLUSIONS AND DISCUSSION OF WORKING PAPERS REVIEW (in order of presentation)

Area 4

Conclusions:

- Landings in 2005/2006 were 133 tonnes (t) against a Total Allowable Catch (TAC) of 150 t. An interim TAC of 100 t was set for the 2006/2007 season, which opened 1 October 2006.
- Commercial catch rates in 2005/2006 (11.4 kg/h) declined from the previous 4 years and were below the median for the time-series (21.3 kg/h). Average catch rates from October 2006 (9.9 kg/h) are 18% lower than the average for the same time in 2005 (12.2 kg/h).
- Survey numbers indicate that the stronger than average 1998 year-class has been fished down, and there are no indications of any substantial recruitment for the next two to three years.
- A catch of between 100 t and 125 t in each of 2006/2007 and 2007/2008 would result in exploitation rates with a 50% or lower probability of exceeding 0.2.

Comments and Questions:

Landings, Catch Rates, and Meat Weight Samples

Scientific Reviewers:

Comment: The level of variation in survey looks about 30%. However, overall the survey and fishery coverage is high.
Answer: 30% would be high, but there is a high level of coverage.

Comment: Commercial sampling in 2005 was up to 6000 samples/year and 1000 samples, subsequently.
Answer: Landings have been lower and the sampling is a reflection of that.

Participant Reviewers:

Question: What influence does the meat weights being based on the survey have on the average values?
Answer: There is some influence on the timing of the survey. For most of surveys, the influence, if any, is small. In September, there could be a change in meat weights.

Question: Scallop seem small with respect to shell height. Lobster meat yield is low. Is this the result of state of the ocean and low plankton levels?
Answer: 2001 satellite information indicates plankton started early. 2001 scallop meat was up everywhere.

Question: Could this be useful for prediction?
Answer: Could be, but the work has not been done.

Comment: Interim TAC for 2005 came from the RAP meeting. Final result was an interim of 150 t for 2006/2007. Full Bay requested 100 t. If the fishery is looking good it could go up, but fishing did not look good.
Answer: This will be corrected.

Survey and Numbers

Scientific Reviewers:

Comment: Lined gear is up to 80 mm and unlined less than 80 mm shell height. The densities are high and this seems to cause ratio changes. The lined gear seems to have a higher efficiency.
Answer: Model assumes relative efficiency is constant, the graphs are not adjusted for a change in catchability. Yes, lined gear has a higher efficiency.

Participant Reviewers:

No comments.

Population Model

Scientific Reviewers:

Comment: TAC seems to reflect changes in survey biomass.
Answer: Yes, since using commercial vessels we have been able to increase sampling and better monitor recruitment.

Comment: Catch per unit effort (CPUE) versus survey CPUE is the fitting and analysis in log space. Fitting in log space might change predictions because much of the data is near the origin.
Answer: Yes, log space is used in the population model, but estimates in log space may not look as good. In model, deal with real numbers not logged.

Question: Why not use both survey and fishery CPUE in the model?
Answer: Redundant information, and is not helpful.

Comment: This might help at low stock size.
Answer: This has been looked at and it does not help much.

Comment: The last two years of data are not treated as a separate index.
Answer: True.

Comment: Clarify text for Figures 44 and 46. Provide confidence intervals for survey index.
Answer: This is not done because uncertainty is built into model and advice.

Comment: Non-fishing mortality should show up in clappers.
Answer: Clappers depends on how many adults; have to express as a mortality rate.

Question: So we would expect fewer clappers relative to other years? I am trying to reconcile increase in mortality rate to observed occurrences of clappers.
Answer: We are interpreting this as an increase in mortality.

Question: Figure 47 needs error bars. Year to year variation change from 05-05 and may not be significant. Figure 48: are the residuals raw residuals?
Answer: Yes, standardized residuals have a similar pattern.

Comment: Residuals are negative each year, and indicate a consistent bias.
Answer: Model is robust to this.

Question: Please explain Figure 49.
Answer: Model produces a distribution of estimates over range of scenarios. P(extreme) represents the probability that an observation is more extreme than what is observed.

Question: Figure 50. Explain the differences in predicted and observed.
Answer: Growth varies and this causes some of the differences. We need to find a way to include this.

Comment: Retrospective would be useful diagnostic to include.

Participant Reviewers:

Question: Surveys are important and we won't be able to do as many stations as last year. Need to have discussion on how to keep survey levels up. What kind of dollars are needed? This is the best sampling we have ever had; what does it cost? The conversation could start at Inshore Scallop Advisory Committee (ISAC). How much would we be losing? We could hire someone; what training would be required? Fishery itself could be used as an opportunity to know what is going on.
Answer: A small working group could be formed to look at these questions.

Comment: A map of the clapper distribution would be helpful, showing where they normally occur. This would help identify abnormal events.

Comment: Figure 46. Biomass is comparable to other times in past. Low levels of recruitment cause a decline in recruitment.

Answer: Recruitment hypotheses:

1. When stock is large, recruitment down because fished out before egg bearing time.
2. Environmental signal up but unknown.
3. Density of scallop, settlement density not as good.
4. Threshold limit for food and settlement.

Question: Are incidences of good recruitment further and further apart?
Answer: Survey is limited in time. In population models, fishing seems to cause this type of pattern.

Stock Status

Scientific Reviewers:

Question: Probability of exceeding target is about 0.5 for Area 1A and about 0.3 for Area 4. Why?
Answer: We have not had the discussion or a process for setting appropriate level. Setting probability is more social than science.

Comment: 0.2 exploitation rate, yield per recruit (YPR) would indicate more explicitly.
Answer: YPR was done 5 years ago and 0.2 came out as F_{max}. Need to examine through simulation and ask the question, "If we would have taken this approach 15 years ago, what would have happened to us?".

Participant Reviewers:

Comment: Industry needs more information of this type.

Forecast

No comments.

Area 6

Conclusions:

- Landings to 10 November 2006 were 91 t against a TAC of 100 t.
- The Mid Bay catch rate may be a better reflection of population trends as it is based on somewhat higher levels of effort, but this index does not indicate any large changes in the last ten years. The commercial catch rate for the Full Bay fleet increased from 2000 to 2004, but given the low levels of effort, this index may not be tracking changes in the population.
- The abundance of commercial size scallops appears to remain unchanged from 2005 in areas 6A and 6C, and has possibly declined as much as 44-46% in Area 6B. Above average recruitment was only detected in Area 6A.
- There is no evidence to advise increasing the TAC for 2007 above the current catches of 82-91 t.

Comments and Questions:

General

Scientific Reviewers:

Question: Fixed stations are not carried over from year to year. Is there a variance estimate for these stations? Additional stations are random from year to year.
Answer: Stations are selected according to time allowed. Not clear how to get variance estimate from fixed stations.

Participant Reviewers:

Question: Any surveys in the Grey Zone?
Answer: No.

Comment: There seems to be a trend to more patchiness.
Answer: Part of this might be a matter of detecting because of increased sample size.

Comment: From industry point of view, fixed stations are best because the surveying occurs where the fish are.

Commercial Fishery

Scientific Reviewers:

Comment: Low level of fishing effort for Full Bay, one or two boats. Mid Bay fleet is a better indicator.

Comment: After fishing closed, there were 10 t taken from the Grey Zone. This is not mentioned. Should also mention that the area includes U.S. fishermen. Information on the Grey Zone should be included.

Comment: No mention of time and how the fishery is conducted over the two month period and why. Landings reflect a lot of what happens in weir and lobster fishery.

Comment: We are trying to detect the effect of fishing on the indices. Does CPUE reflect the survey? Do not see much change in survey at these levels.

Comment: Fishing in Area 6A is marginal. Ten-twelve tonnes from Grey Zone were taken from 6A that is not included.
Answer: Grey Zone is a separate management plan, we need guidance on how to separate the Grey Zone and Area 6A.

Comment: One method would be to issue separate licenses and report as Area 6E. Description of fishery should include historical openings and closures and landings.

Comment: Catch TAC established in Area 6B by using average catches. Except that because of TAC last year the TAC was caught quicker. Had there been an Area 6A fishery, common catch would have been another 20 t.

Comment: CPUE has not changed regardless of TAC. Area 6A is stable and is the area that would stay open. CPUE in other areas of Bay of Fundy have greater oscillation. Here boats go for one quick catch and then the next.
Answer: Survey data must be considered to determine what is going on in the population.

Participant Reviewers:

No comments.

Survey

Scientific Reviewers:

Comment: Equation on page 15. Show smaller steps in how table derived. The 2005 influence is not clear. The contributions need to be teased out. Long-term history is important, particularly with respect to recruitment. Events in early 1980's removed through the 1990's.

Comment: CPUE not good indicator of biomass because of low levels of effort.

Question: Plots of survey mean/tow. Do they include fixed stations in figure?
Answer: No only include random stations. Fifty-nine stations are random, compared to 18 stations 10-15 years ago.

Comment: Number at top based on all, clarify in text.

Comment: Area 6A in the past is based on two random sets.
Answer: These are not taken into account.

Participant Reviewers:

Comment: Different fleet make up in 1980. No Mid Bay fleet. Fleet matured and when came back there was more effort than in 1981 and 1982.

Answer: During 1988-1989, more effort than elsewhere.

Question: Do you differentiate results from areas?
Answer: We are able to take growth into account in other areas, but not here because the data is not available.

Stock Status

Scientific Reviewers:

Question: Trying to integrate observation. Peak and valley model. No peak recently, good valley versus bad valley. Looked at survey results for Area 6A, moderate valley, Area 6B is poor. No evidence for higher TAC. What does CPUE mean? Is CPUE on the increase because of recruitment or because of fishing pattern? Survey indicates decline but CPUE does not.
Answer: Mid Bay CPUE not changed; all we had last year was CPUE for Mid Bay.

Comment: No evidence for increase.
Comment: Duck Island could be considered separately. A higher percentage is taken from Duck Island now, compared to previous years.
Answer: Could add extra strata for Duck Island.

Participant Reviewers:

Comment: CPUE not different between 2006 and 2002 and 2000. Look at differences in catch.
Answer: CPUE is confusing because same whether landings are high or low.

Comment: Full Bay CPUE, one good day in Duck Island.

Comment: Duck Island influences results, could almost track fishery as Area 6B fishery. After April 1, not always fishing in Area 6. Evidence to increase because of results in Area 6B.
Answer: Duck Island Sound provides no evidence to increase or decrease. Area 6B size distribution very different, area 6A has looked better.

Area 1

Area 1A - Conclusions:

- Landings were 160 t against a TAC of 100 t for the 2005/2006 season.
- Commercial catch rates have been declining from a recent peak in 2002.
- Survey estimates indicate that the larger than average 1998 year-class has been fished down, with no strong upcoming year-classes evident in the 2006 survey size frequencies.
- A fishing strategy of 75 t in Area 1A for 2006/2007 and 2007/2008 has approximately a 0.30 probability of exceeding exploitation rate of 0.2, which could allow the population biomass to increase slightly.

Area 1B - Conclusions:

- Landings were 144 t against a TAC of 225 t for the Full Bay fleet in the 2005/2006 season, and 185 t against a TAC of 225 t for the Mid and Upper Bay fleets in the 2006 season.
- Commercial catch rate has declined for all fleets during the last three years, but it is still above the low that was observed in 1997.
- There were signs of two significant year-classes in the 2006 survey that will recruit to the fishery in 2007 and 2008.
- In the 2006 survey, there was no substantial change in abundance of commercial size scallops from 2005, but meat yield was the lowest of the last three years in the main areas of abundance.
- If meat yields persist at low levels during 2006/2007, fishing mortality will be higher than expected for any TAC established. Meat yield sampling will be required to evaluate this concern.
- If meat yields in 2006/2007 increase to levels observed during 1997-2005, then there would be no reason to change the advice provided in 2005/2006 (400 t).

Area 1 - Comments and Questions:

General

Scientific Reviewers:

Comment: Mid Bay South: 8-16 random, 2–8 random. See bounds from within choosing sites.

Participant Reviewers:

Comment: Recruits – large enough during survey to be fishing or between survey fishing. Are these recruits mentioned in last year's SAR; they are not seen as strong as expected.
Answer: Over period of fishing should recruit to the survey.

Landings, CPUE, and Meat Weights

Scientific Reviewers:

Comment: Landing 160 t against TAC of 100 t.
Answer: Fishing was not closed in time.

Participant Reviewers:

No comments.

Surveys

Area 1A - Comments and Questions

Scientific Reviewers:

Comment: Plots of survey distribution from multitude of years. Plots of maps from period of years. Follow patches of recruits. Mean versus median, parts of 1988-1991 use median, be consistent.

Comment: Show clapper number ratio rather than number.

Comment: Overall landings two spikes occur in tandem. Both events should be everywhere.
Answer: Recruitment events in 1998 year-class, did not extend into Area 4 to Digby Area 8-16 mile.

Question: Are growth rates same in areas 1A and 1B?
Answer: Effort shifted from N.B. to N.S. 1998 year-class mainly on N.S. side. Cape Spencer recruitment came in. Figure 18, don't see year-class as strong in Cape Spencer as on N.S. side. We could add effort to show if it has been re-directed.
Comment: Logbooks no length frequencies.

Participant Reviewers:

Comment: Log records from commercial fishery. How close catches are to areas 1A and 1B line. Fairly significant amount of fishing close to line. Tow start in one area and end in another. Boats verbally indicated that they were fishing in both. Digby Area 8-16 mile box, potential spillover.

Answer: Logs only show one point/day. Might help with question about areas 1A and 1B fishing and abundance.

Stock Status Forecast

Scientific Reviewers:

Comment: Good agreement between predicted and estimated. Experimental work is needed to look at selectivity.

Answer: Need time, tow cam work would help. Natural Resources Canada (NRCan) is doing benthic mapping of Bay of Fundy. Bottom information might help explain.

Comment: Don't estimate exploitation rate at higher catches.

Answer: Need to calculate, will put it in.

Comment: Need description of model and diagnostics. Figure 50, looking better than Area 4, and diagnostics might explain that.

Participant Reviewers:

Question: Area 1A – decline in CPUE. How does CPUE in Area 1A compare to areas 4 and 1B?

Answer: Area 1A is 15, Area 4 is 11.4, and Area 1B is 20.

Comment: TAC advice versus absolute CPUE. According to fishermen, Area 4 CPUE low, not much point in fishing, hence did not take TAC. Model and Exploitation Rate seem to fit Area 4. Area 1A seeing different. Area 1A can support higher level. TAC 100 t and exceed by 60 t was substantial. What was the effect on biomass? Looks negligible. Figure 5 recruitment event recent. Population still has younger growing scallops. One for valley one for boom.

Area 1B - Comments and Questions

Commercial Fishery

Scientific Reviewers:

No comments.

Participant Reviewers:

Comment: TAC not caught, fish different areas in summer compared to winter. If we had fished during the month of August we would have exceeded the TAC.

Comment: Two mile zone along shore opened January to April. Quota caught to closed.

Comment: Some scallops up the bay, but scallops Mid Bay and Full Bay in Area 1B had good fishing and good yield. Quota caught and shut down.

Comment: Every summer, meats are watery, spawning, and yield goes down. People stop fishing. Catches same numbers of animals, but half the weight. Left the area because cannot afford the price of fuel. Takes three months of best fishing and cannot catch quota. Twice as many animals to get the same weight. Opportunity is there, maximize yield/recruit. Don't want to take twice as many, because quota is left in water, but there is no change in abundance. Saw in survey and happens every now and then.

Answer: Timing of the fishery can be discussed.

Survey

Scientific Reviewers:

Comment: Recruitment trends influenced by additional stations. Mid Bay has highest number of recruits.

Answer: Cape Spencer good coverage, Upper Bay similar, Mid Bay North would be a problem as it has been more difficult.

Comment: Summary plots: overall here in population. Three are specific indices should be rolled into one. Mean density for each area instead of by area. Overall biomass up or down. Summary in terms of biomass.

Answer: Overall biomass for Area 1B problematic because of coverage.

Comment: Then provide summary of where resource is.

Participant Reviewers:

No comments.

Stock Status

Scientific Reviewers:

Comment: Length frequency Figure 18. Stock status difficult to assess because of areas. Protect incoming year-classes could be a goal of this survey.

Answer: Quota not reached and CPUE has been going down.

Participant Reviewers:

Comment: Break into two different seasons.

Answer: Third year of decrease. Two year-classes about to recruit. Meat yield will come back up; if still low, then should be left or not fished to get more back.

Comment: Would like to see it in terms of consequences. We would benefit from higher yield. Need to quantify argument on how much.

Area 3

Conclusions:

- Landings in 2005/2006 were 187 t against a TAC of 200 t. An interim TAC of 50 t was granted for October/November of the 2006/2007 season, and the most recent record of landings against the TAC was 11 t.
- Commercial catch rate has declined in this area since the high of 2003, and the 2006 estimate of 13 kg/h falls below the long-term median (14.5 kg/h).
- The survey biomass index indicates an increase in 2006, as the population is mainly made up of older scallops.
- There appears to be little sign of recruitment for 2007.
- Based upon a surplus production model, a catch of 200 t in 2006/2007 would likely result in little change in biomass.

Comments and Questions:

Landings, CPUE, Meat Weights, Surveys, and Advice

Scientific Reviewers:

Question: For 2002, no catch effort elsewhere. Have used CPUE to fit the model and not survey data, this is unusual. Can we use the relationship of the last three points? Surplus production (Figure 36), show data and fit. Could both be used; what happens when try to fit surplus production model? Short-term data and parabola. Fitting non-event dynamics, does not usually work that well.

Answer: Change in survey prior to 2003, pre-fishery versus post-fishery. Low recruitment years don't see recruits. Stock recruitment curve is not seen, but commercial size to commercial size is.

Participant Reviewers:

Question: Most of recruitment inshore seen before? Could the Area 6 approach be used?

Answer: Not in this fishery.

Area 5

Conclusions:

- Landings in 2006 were 6.1 t against a TAC of 15 t.
- Commercial catch rate in 2006 (12.5 kg/h) was lower than the long-term median (21 kg/h) and approximately half of the catch rate reported in 2005.
- The mean number per tow of commercial size scallops declined by 31% from 2005 to 2006. The commercial portion of the population is below the 1997-2005 median, and little recruitment is expected for the next two years.
- The TAC for 2007 should not exceed the average over the low abundance periods (1997-1999) of 10 t.

Comments and Questions:

Landings, CPUE, Meat Weights, Survey, and Advice

Scientific Reviewers:

Comment: Ten tonnes looks bold, gear is efficient. Data quite messy, length frequency will rapidly change. Use growth to bet production/biomass ratio.
Answer: Must be ad hoc, area too small for model.

Participant Reviewers:

Comment: All effort and catch in one week.

REFERENCES

Smith, S.J., M.J. Lundy, D. Roddick, D. Pezzack, and C. Frail. 2003. Scallop Production Areas in the Bay of Fundy and Scallop Fishing Area 29 in 2002: Stock Status and Forecast. DFO Can. Sci. Adv. Sec. Res. Doc. 2003/010.

APPENDICES

Appendix 1. Invitation Letter

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17 November 2006

Distribution

Subject: Stock Assessment of SPA 1, 3, 4, 5, and 6 Scallop Stocks (RESCHEDULED)

The stock assessment of the inshore Bay of Fundy scallop stocks will be reviewed at the **Future Inns Dartmouth, 20 Highfield Park Drive, Dartmouth, Nova Scotia, during 12-13 December 2006**, commencing at 9:00 am. The meeting's terms of reference are attached.

The purpose of the review is to consider the assessments' data inputs, to examine the scientific approaches of the stock assessments, to identify any weaknesses in data and/or methodology, to help improve the clarity of the assessments, and to make recommendations for further research. It will include a detailed examination of the stock assessments and writing of Science Advice Reports.

Copies of the assessments and the draft stock status reports will be sent to participants one week before the meeting. At the meeting, DFO science staff will provide a brief overview of the assessments, which will include the main conclusions, the supporting evidence, any new methods, and major limitations. The presentation will be followed by discussion among the participants. The finalised stock status report will be prepared at the meeting. The minutes of this meeting will be published as a proceedings.

You can view the technical papers as of **5 December 2006** for the session at the following RAP website: (the password is 2006bofsclp in all lower case letters).

http://www.mar.dfo-mpo.gc.ca/science/rap/internet/workingpapers2006.htm

I would appreciate if you could confirm your attendance with Daisy Williams at (902) 426-3573 (WilliamsDM@mar.dfo-mpo.gc.ca).

We greatly appreciate your contribution to this valuable exercise.

Original signed by:

Ross Claytor
Meeting Chair

Attachment

cc: M. Sinclair
R. O'Boyle
P. Boudreau
D. Williams

Distribution

Science / Sciences

Mark Lundy
Stephen Smith
Ross Claytor
Jae Choi
John Tremblay
Sherrylynn Rowe
Scott Coffen-Smout

Government - Others / Gouvernements – Autres

Maureen Butler, Maritimes
Ron Cronk, NB/N.-B.
Linde Greening, NS/N.-É.
Marc Johnston, NB/N.-B.
Jim Jamieson, Maritimes
Anne Harrington, DFO/MPO, St. Andrews
Anne Sweeney, DFO/MPO Yarmouth
Gerald Cline, A/Chief C&P

Industry / Industrie

Michael Fraser
Greg Hamilton
Vance Hazelton
Klaus Sonnenberg
R.G. (Dick) Stewart
Greg Thompson
Glen Wadman
Ralph Brown
Reg Hazelton
Brian Longmire
Grant Woodworth

First Nations

Acadia - Curtis Falls
Eskasoni - Blair Bernard
Millbrook - Adrian Gloade
Membertou - Lance Paul
Indian Brook - John Ameriault
Tobique - David Bollivar
NBAPC - Jason Harquil
St. Mary's - Candice Paul/Gina Brooks
Woodstock - Chief Jeff Tomah
Oromocto - Evelyn London
Kingsclear - Patrick Polchies
Annapolis - Holly MacDonald

Appendix 2. Terms of Reference

Science Advisory Process on
Bay of Fundy Scallops

12-13 December 2006

Future Inns Dartmouth
20 Highfield Park Drive
Dartmouth, NS

TERMS OF REFERENCE

Context

The status of Bay of Fundy (Areas 1,3,4,5 and 6) scallop was last assessed in 2005. The current assessment is requested by Fisheries and Aquaculture Management to provide harvest advice for 2007.

Objectives

Area 1 Scallop

- Assess the status of Area 1 scallop. The assessment should include:
  - An analysis of available commercial and survey information since 1981.
  - Application of the assessment model used in CSAS research document 2003/010 for the 8–16 mile Digby area for Full Bay fleet.
- Review the preliminary advice provided for the Full Bay fleet for the 2006/2007 fishery and provide preliminary advice for the 2007/2008 fishery.
- Provide updated advice for the 2007 fishery.
- Produce a section of the Inshore Scallop Science Advisory Report documenting the results of the assessment.

Area 3 Scallop

- Assess the status of Area 3 scallop. The assessment should include:
  - An analysis of available commercial and survey information.
- Provide updated advice for the 2007 fishery.
- Produce a section of the Inshore Scallop Science Advisory Report documenting the results of the assessment.

Area 4 Scallop

- Assess the status of Area 4 scallop. The assessment should include:
  - An analysis of available commercial and survey information.
  - Application of the assessment model used in CSAS research document 2003/010.
- Review advice provided for the 2006/2007 fishery and provide preliminary advice for the 2007/2008 fishery.
- Produce a section of the Inshore Scallop Science Advisory Report documenting the results of the assessment.

Area 5 Scallop

- Assess the status of Area 5 scallop. The assessment should include:
  - An analysis of available commercial and survey information.

- Provide advice for the 2007 fishery.
- Produce a section of the Inshore Scallop Science Advisory Report documenting the results of the assessment.

Area 6 Scallop

- Assess the status of Area 6 scallop. The assessment should include:
- An analysis of available commercial and survey information since 1997.
- Provide advice for the 2007 fishery.
- Produce a section of the Inshore Scallop Science Advisory Report documenting the results of the assessment.

- For all areas, estimate by-catch of non-scallop species in the fishery for as many years as possible

Outputs

CSAS Science Advisory Report
CSAS Research document
CSAS Proceedings

Participants

- DFO Science
- Fisheries & Aquaculture Management
- NS provincial representatives
- and the fishing industry

Appendix 3. Agenda

PROPOSED TIMETABLE

Stock Assessment of SPA 1, 3, 4, 5, and 6 Scallop Stocks

12-13 December 2006

Future Inns Dartmouth
20 Highfield Park Drive
Dartmouth, Nova Scotia

Tuesday, 12 December 2006

09:00: Introduction

09:10-10:00: SPA 4

10:00-10:30: Break

10:30-11:00: SPA 4

11:00-12:00: SPA 1

12:00-13:30: Lunch

13:30-14:00: SPA 1

14:00-15:30: SPA 3

15:00-15:30: Break

15:30-16:30: SPA 6

16:30-17:00: SPA 5

Wednesday, 13 December 2006

09:00: Recap

09:15 to 10:00: SAR

10:00-10:30: Break

10:30-12:00: SAR

Appendix 4. List of Participants

Stock Assessment of SPA 1, 3, 4, 5, and 6 Scallop Stocks

12-13 December 2006

Future Inns Dartmouth
Dartmouth, Nova Scotia

Name	Affiliation	Telephone	Fax	Email Address
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Ron Cronk	NB Dept. of Fisheries and Aquaculture	(506) 662-7026	(506) 662-7030	Ronald.CRONK@gnb.ca
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Tom Robarts	Upper Bay of Fundy Licence Holders	(902) 392-2772		t_robarts@hotmail.com